
A Spatial Analysis of Unevenness in the Social-Economic Development of Regional Municipal Units

Svetlana Sergeevna Mikhailova^{1,2}, Nikolay Il'ich Moshkin¹, Dashi Dashanimaevich Tsyrenov¹, Erzhena Tsyrenovna Sadykova³,
Sambrika Dorzho-Nimaevna Dagbaeva³

Abstract

This paper examines a methodology for the analysis of the uneven development of specific areas within a region in terms of their social-economic development and economic potential, as well as existing constraints to exploiting this potential. The authors summarize the most critical issues in the social-economic development of municipal units within the Russian Federation and find one of the main causes of those to be the insufficient consideration of the characteristics of specific areas in implementing policy for the development of municipal units.

The paper brings forward a system of indicators for assessing the unevenness of the social-economic development of regional municipal units that is designed to generate a comprehensive characterization of the object under study by way of stage-by-stage examination of its components. To investigate differentiation among municipal units in level of social-economic development, the authors employ a method developed by researcher S.A. Aivazyan. Thus, the study's major approach is grounded in calculating an integral criterion for the population's quality of life.

The authors conduct a cluster analysis of municipal units within the Republic of Buryatia based on key indicators of economic development, which helps gain an insight into the structure of the territorial imbalance in industrial development. The findings of this study may be recommended for use by federal and regional authorities seeking to enhance their management of the development of a municipal unit based on a differentiated approach.

Key Words: municipal unit, sustainable development of a region, unevenness in regional development, spatial inequality, RF (Russian Federation) constituent

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¹ Buryat State University, 24a Smolin St., Ulan-Ude, 670000, Russia

² East Siberia State University of Technology and Management, 40v Klyuchevskaya St., Ulan-Ude, 670013, Russia

³ Baikal Institute of Nature Management Siberian branch of the Russian Academy of sciences 6 Sakhyanovoy St., Ulan-Ude, 670047, Russia

Introduction

At any given point in time, a judgment of territorial unevenness in the development of a regional system makes sense only by comparison with a particular standard level or with some other regional system (Slepneva, 2016). It is certain that the economic and social space cannot be entirely homogeneous – so it is perfectly OK, and may in some instances even be beneficial, if there is some differentiation of the social-economic space, since differentiation may inject some dynamism into the development of the regional economy (Tsyrenov, 2015). In the current literature, the level of regional differentiation in Russia is mostly regarded as atypical, with a much greater degree of differentiation being noted compared with unevenness levels deemed suitable for effective development, when viewed relative to developed countries (Kuznetsova, 2006). On the whole, regional differentiation is regarded as both a process and an outcome of the formation of distinctions between particular areas within the state. In this regard, it is worth pointing up two major characteristics of regional differentiation: (1) it is always relative and is there only by comparison with something else; (2) it can be characterized through a variety of miscellaneous indicators, with only those selected that are most relevant to a specific case.

Relevance of the Issue

At present, there are difficulties in ensuring even and sustainable development in regions across Russia due to high levels of non-uniformity and imbalance across the nation's economic space, which is reflected in profound social-economic differentiation among regions. Non-uniformity in the economic development of regions is observed on virtually all parameters for social and economic development, with the growing economic domination of certain regional systems over others being observed. (Medvedeva, *et al.*, 2016; Akopova and Przhedetskaya, 2016; Frank *et al.*, 2016).

The emerging differences in regional development are, on the hand, injecting some dynamism into the processes of formation of a single regional economic space, and, on the other, are leading to wider gaps between the social-economic development levels of areas within a region. That being said, it is the nature of economic development that determines substantially the process of differentiation in economic indicators within the region itself. The economic development of an entire region is governed, in turn, by the nature of the territorial stratification and economic development of municipal units that make it up. Therefore, in developing the general concept of the development of a regional economy, it pays to factor in some of the specific characteristics of the development of municipal economic systems. It is in this regard that researchers have been taking an interest in the comprehensive economic-statistical analysis of unevenness in the social-economic development of regional municipal units, especially from the perspective of regional policy designed to ensure well-balanced economic development across the region and the nation as a

whole. There is all the more reason for this as, in terms of Russia's regional governance practices, due to great diversity among RF constituents and the complexity and multi-scale nature of objectives pursued, there is still no uniform and universally accepted methodology for assessing unevenness in the social-economic development of regional municipal units.

Importance of the Issue

Uneven regional development reflects the state of a regional system characterized by significant differences in the level of economic, technological, institutional, social, and environmental development, which tend to impair the sustainability of the regional system and, on top of that, may lead to its deformation, resulting in differentiation and asynchronicity in the development of the system's elements. All this may eventually lead to declines in the region's combined potential and affect the social-economic state of affairs both in the region as a whole and in its municipal units in particular (Sokolovskii and Grentikova, 2012; Shekhovtsov et al., 2017).

Greater unevenness in development may result in problem areas that need special support, much inequality in standard of living among the people, their migration to better areas, withering growth, and the "extinction" of entire populated areas. Therefore, having acknowledged differentiation in Russia as a fact, it may be worth taking a detailed look at its current depth and scale, examining the reasons behind existing differences in the social-economic development level of areas, and trying to come up with ways to combat excessive unevenness and its negative effects. (Kovalenko, *et al.*, 2016; Medvedeva, *et al.*, 2015; Stroeveva, *et al.*, 2015; Ovchinnikov *et al.*, 2016; Savina, 2016).

The findings of an analysis of the Russian and foreign literature suggest that the nature of unevenness in regional development may be explored through the (1) analysis of existing social-economic differentiation in regional development using indicators of variation and structure, (2) construction of multidimensional classifications typologizing regional constituents by type of social-economic development, and (3) analysis of reasons behind the emergence of differences in levels and rates of social-economic development among regional constituents.

Differentiation as a form of manifestation of unevenness reflects the difference or deviation of the features and parameters of the system's object under study from an established standard or norm or from features or parameters that are typical for systems of a similar kind. It is natural for different economic-geographic conditions across regions in Russia to influence the way the characteristics of, and differences in, social-economic development are shaped: there is differentiation among the population in income, education, health, and other characteristics that are a mandatory condition for, and an outcome of, the development of regions (Vanchikova, Osodoeva, & Popova, 2014).

Approaches to Assessing Uneven Socio-economic Development across Municipal Units

The issue of uneven development is among the most important in economics, and it has been suggested that uneven development is an indispensable feature of social-economic systems that is traced via quantitative attributes. Objective inequality in resources, conditions and potential for the development of various territorial units leads to greater territorial differentiation, i.e. considerable differences in key parameters of social-economic development in particular areas.

Currently, there are several concepts that are essential to the study of the economic space, including the territorial and resource-related ones. Among the major proponents of the territorial approach is A.G. Granberg, who has suggested that “non-uniformity or differentiation across the economic space” is governed by the differences in climatic and natural conditions, lifestyle and entrepreneurship, scale and purpose of the use of natural resources, being located at the core or periphery, agglomeration advantages, and the area’s production-technological set-up. In addition, non-uniformity may be influenced by political, institutional, and social-cultural factors (Chepik, 2015). A major exponent of the resource-based approach is V.V. Radaev, who views the economic space as a “collection of economic actions”, which he construes as a “certain relationship between ends and means”, and suggests that “actions have a special character”, with limited resources acting as elements in an economic action.

A prominent Russian researcher of unevenness in economic development was RAS academician Yu.V. Yaremenko has explored the structural characteristics of the Soviet Union and then the Russian economy. Yaremenko maintained that, when broken down into sectors, Russia’s economy could be regarded as “technologically non-uniform”, which he set down to the USSR’s economic policy. In the scholar’s view, the Soviet economy mainly consisted of “technological enclaves” (sectors within the military-industrial complex) and “colossal zones of technological failures” (branches of the civilian sector of the economy, mainly oriented toward internal demand).

The technological inhomogeneity of the Russian economy has led to most cutting-edge technology, the nation’s best qualified manpower, its best resources, and enormous investment capital being concentrated in the defense sectors of industry (the economy’s first pole) through the use of administrative and political methods (Zolotareva, Nagaslaeva, Vanchikova, Khaltava, & Bulgatova, 2016). It is apparent that this was accompanied by the technological emaciation of the civilian sectors (the economy’s second pole) and led to the extensive expansion of production based on the use of mass (lower-quality) resources. In this context Yu.V. Yaremenko points out that the nation’s zones of concentration of modern production also incorporated the concentration of social benefits, which led to the outflow of people

from rural areas, small and medium-sized cities to large cities and, consequently, resulted in the social degradation of the population and economic downfall of entire regions and industries (Mikhaylova, Budazhanayeva, Sarycheva, & Bakumenko, 2015).

Thus, uneven regional development reflects the state of a regional system characterized by significant differences in the level of economic, technological, institutional, social, and environmental development, which tend to impair the sustainability of the regional system and, on top of that, may lead to its deformation, resulting in differentiation and asynchronicity in the development of the system's elements. All this may eventually lead to declines in the region's combined potential and affect the social-economic state of affairs both in the region as a whole and in its municipal units in particular (Sokolovskii & Grentikova, 2012; Chimitdorgieva, Aydaev, Tsyrenov, Balkhanov, & Malishev, 2016; Faizova, *et al.*, 2015; Fireescu and Popescu, 2015; Sibirskaya *et al.*, 2016).

Status of the Issue

The present-day configuration of the economic space is distinguished by deepening territorial differentiation on a number of key economic and social parameters. This trend clearly signals the need to come up with a practically acceptable methodology for assessing unevenness across the economic space and identifying specific factors underlying the process of differentiation in an area. Among the major reasons behind spatial unevenness are low diversification levels in the economy of regions, uneven population distribution, and the differences in regions' economic-geographic situation. This definitely calls for some research into the major factors for and possible effects of unevenness across the economic space in the context of the well-balanced development of the regional economic system. However, researchers have yet to reach consensus about the construal of this phenomenon relative to the municipal level of development.

Main Idea, Hypothesis Testing

The central idea underlying this study is the development of a methodology for exploring the major factors for and possible effects of unevenness across the economic space in the context of the well-balanced development of the regional economic system with a view to later adjusting a model for economic growth in regions.

Research Methodology

This study's subject is unevenness in the social-economic development of regional municipal units and its object is a collection of statistical indicators, specific methods and models characterizing unevenness in the development of regional

municipal units. The study's purpose is to explore unevenness in the development of the regional social-economic system from the perspective of a municipal unit in a climate of global economic instability. This study of processes related to unevenness in the social-economic development of municipal units within a region will be carried out across the following areas of focus:

- dynamicity of economic development (the index of physical volume of industrial production, investment, and construction work; retail turnover; the volume of paid services provided to population; etc.);
- industrial potential (the index of industrial production; the volume of industrial output);
- efficiency of agricultural production (the index of physical volume of agricultural output; the total area under cereal crops; meat and milk production; total livestock numbers; etc.);
- investment activity levels and construction volumes (the index of physical volume of investment and construction work; investment in fixed assets per capita; the volume of residential buildings put into service; etc.);
- financial sustainability of the economy (profit per employee; the relative share of loss-making organizations; overdue receivables and payables; return on assets levels;
- population income levels (average monthly pay; arrears of pay; per capita income; etc.);
- population employment levels and crime rate (the rate of unemployment, inclusive of hidden unemployment; the number of unemployed individuals per job opening; the number of crimes registered; etc.) (Smoleev, 2013).

This proposed system of statistical indicators of unevenness in the social-economic development of regional municipal units may help obtain a comprehensive characterization of the object under study by way of stage-by-stage examination of its components. The system incorporates 3 blocks of indicators: 1) basic indicators characterizing the production and resource potential of municipal units, 2) indicators of the structure of and structural changes in unevenness in the social and economic development of municipal units, and 3) indicators of the dynamics of unevenness characterizing the orientation of changes as an indicator of the effectiveness of measures for influencing economic processes taking place in municipal units.

The latest literature employs the following ways and methods of assessing unevenness in the social-economic development of regional municipal units: integral indicators of development to be used for ranking the regions; various models for the quantitative assessment of the effect of factors on the region's development level and multidimensional classifications designed to help typologize unevenness processes (Saktoev, Vanchikova, Slepneva, Bulatova, & Khaltayeva, 2015; Dasanayaka and Sardana, 2015; Tyaglov *et al.*, 2017).

Aims of the Study

The study aims to explore statistically the structure of unevenness in the social-economic development of regional municipal units, which involves:

- providing characterizations of unevenness in the economic and social development of municipal units within a region;
- undertaking ratings-based assessment of unevenness in the social and economic development of regional municipal units.

The authors seek to explore statistically the effect of factors of reproduction on unevenness in the development of regional municipal units, examine the formation of production specialization clusters with a view to optimizing the spatial structure of the economy of the Republic of Buryatia, and look into forecasting the index of unevenness in the economic development of regional municipal units.

Results

The Republic of Buryatia is comprised of 23 municipal units, which differ considerably in the level of social-economic development. The region possesses unique natural-resource potential, which has yet to be fully harnessed in view of certain difficulties, like a lack of relevant infrastructure, the region's complex landscape, and ecological restrictions. The region is currently witnessing labor outflows, which mainly is due to low wages, fewer jobs available in the basic sectors of the economy, and a lack of newly-created jobs in the region's developing types of economic activity. The Republic of Buryatia is currently among Russia's poorly developed regions that are incapable of carrying out the structural transformation of the economy using financial resources of their own and not particularly attractive to private investors.

The findings of the authors' spatial analysis indicate that the region is currently characterized by growing social-economic differentiation among its rural areas, which are comprised of localities with a high, medium, and low level of social-economic development. Vast differences in the budget capacity of municipal units have been observed. Over the last 5 years, the social-economic status of most of Buryatia's rural areas within the regional social-economic space has stayed the same for the most part, while there are some areas whose status relative to the above group has gotten worse, which is due to the recessionary state of agricultural production and low levels of diversification in the local economy.

The south of the Republic of Buryatia is comprised of the Tunkinsky, Zakamensky, Dzhidinsky, Kyakhtinsky, and Bichursky districts. All of these regions specialize in meat-and-dairy cattle farming, grain crop and feed crop production, potato farming,

and vegetable farming, with a decent focus on forestry and woodworking, as well as manufacture of construction materials. Note that the southern regions of the Republic of Buryatia possess quite appreciable recreation potential, which provides the preconditions for the development of tourism. The largest portion of the republic's territory is occupied by regions classified as the regions of the Extreme North, namely the Barguzinsky, Bauntovsky, Kurumkansky, Muysky, Okinsky, and Severo-Baykalsky districts and the city of Severobaykalsk. These municipal units possess vast natural potential, made up of forest, water, and recreation resources and reserves of mineral resources. The economy of the regions within the central part of the Republic of Buryatia is dominated by agriculture, forestry, and extractive and processing industries. Here, agriculture is represented by production of meat, milk, and grain. Currently, a major growth area for the economy of the central regions is their tourism-recreation potential.

To investigate differentiation among municipal units in level of social-economic development, the authors employ a method developed by researcher S.A. Aivazyán (Aivazyán, 2000) to explore issues related assessing the population's quality of life. The method is grounded in calculating an integral criterion for people's quality of life. The findings of the authors' study reveal that the development of the Republic of Buryatia is characterized by intraregional unevenness on particular economic and social indicators, as well as on the overall level of social-economic development. The following changes in this unevenness were registered in 2005, 2010, and 2015:

- a change in the number and lineup of leader regions;
- a change in the nature of relationship between the overall level of social-economic development and particular spheres (economic and social).

The findings suggest there is unevenness in regional economic and social development during the period of economic growth. The main reason behind this non-uniformity is the varying nature of reproduction mechanisms in municipal units, in the economic and social sphere alike.

Accordingly, there arises a need to explore the effect of factors of reproduction on the rate of social-economic development in regional municipal units. The authors' major suggestion is that resources (factors of reproduction) tend to be concentrated in places where return is greater, which explains why these municipal regions are exhibiting accelerated economic growth surpassing that in other municipal units – this exactly constitutes the main reason behind non-uniformity in development.

Any economic system may be viewed as the transformer of resources into material goods consumed by society. The correlation between factors input into the economic system and what is output is described by a production function (Petrov, 2011).

To describe the production complex and non-production sphere of municipal units, the authors employ the Cobb-Douglas production function, used to describe medium-scale production operations characterized by sustainable, stable operation (Kleiner, 1986). Production functions of this type factor in two types of resources: fixed assets and labor. For the purposes of this study, to this the authors are also adding investment in fixed assets. Correlations between production costs and output are crucial indicators of development. All the equations obtained underwent checks on statistical and economic criteria for quality.

Note that initially the study had a selective nature, meaning that it was to be focused on assessing production potential not for all municipal units but just some of them. More specifically, among the municipal units selected were the city of Ulan-Ude (the capital of the Republic of Buryatia), Kabansky District, and Okinsky District.

Indicators for the production complex of municipal units and the volume of retail turnover are highly susceptible to changes in the average number of people employed in the economy and the size of fixed assets. The level of susceptibility to changes in investment in fixed assets is quite low, which is due to the nature of general investment policy, oriented at the social sphere. The sum of the degree exponents in each equation is greater than 1, which points to increased returns if there is a change in the scale of production.

Thus, the findings of the authors' study suggest that the republic's various municipal units have both common trends in the development of their production complex and non-production sphere and unique characteristics of their own. Common to the regions are the high susceptibility of the rate of growth in production output to changes in the average annual number of individuals employed and low elasticity in respect of investment in fixed capital.

Another characteristic common to the municipal units is the considerable differences in growth rates for the various types of resources. It is worth noting here that returns from resources tend to increase when there is a change in the scale of production, which is the case for the regions' production complex and non-production sphere alike.

The findings of the authors' analysis of elasticity lead to the conclusion about the uneven distribution of the response of resulting attributes to changes in factors of production within municipal units. Note that municipal units ranking high on absolute social-economic indicators (the city of Ulan-Ude and Kabansky District) do not always lead the way on indicators of return. One of the crucial stages in optimizing the spatial structure of industrial regions is the identification of existing territorial-sectoral disproportions and determination of the prospects for these disproportions being remediated. Disproportions may occur when there is a mismatch between the growth potential of certain sectors or territories within the

industrial complex of the regional system and their actual growth rates. There are multiple reasons why an imbalance occurs in the economy. Among the major objective reasons are unevenness in the social-economic development of territories, a mismatch between their use of existing natural, manpower, and financial resources, and their climatic and natural conditions (territorial disproportions); the characteristics of cyclic fluctuations, changes in the correlation between demand and supply, etc. (sectoral disproportions). The major subjective reasons include adopting wrong tactics in developing and executing industrial (structural) policy at the various hierarchical levels of management. That being said, the uneven development of the regional economy is a natural process, although there is always the possibility that considerable structural differences in a particular sector will have a negative impact on economic growth as a whole.

Industrial production across the Republic of Buryatia is characterized by considerable territorial and sectoral disproportions, with its bulk concentrated in the region's capital. The authors' analysis identified as the region's specialization sectors the following major types of economic activity: manufacture of transportation vehicles and equipment and production and distribution of electric power, gas, and water. It, however, is worth noting that the republic does not yet have a clear-cut specialization, since the heat-and-power sector is mainly focused on providing for the life activity of the population, while the region's manufacture of transportation vehicles and equipment essentially has to do with the operation of Ulan-Ude's largest enterprise, Ulan-Ude Aviation Plant. Accordingly, it makes sense to analyze the production structure of the economy of municipal units exclusive of the city districts (the cities of Ulan-Ude and Severobaykalsk).

In 2005, some of the region's districts were dominated by one industry only. For instance, extraction of mineral resources accounted for the bulk of industrial production in the Bauntovsky, Ivolginsky, Muysky, Mukhorshibirsky, and Okinsky districts (over 70%). The regions in this group ran no processing operations whatsoever. A similar trend was observed across the Barguzinsky, Kurumkan, Selenginsky, and Tunkinsky districts, their industry being dominated by the heat-and-power sector. There were 3 municipal units mainly focused on processing operations: the Kabansky, Pribaykalsky, and Tarbagataysky districts.

In 2015, sectoral disproportions in industry only increased. Extraction of mineral resources accounted for the bulk of industrial output in the Bauntovsky, Bichursky, Yeravinsky, Muysky, Okinsky, and Severo-Baykalsky districts (over 79%). Production and distribution of electric power, gas, and water prevailed in the Barguzinsky, Dzhidinsky, Kizhinginsky, Selenginsky, and Tunkinsky districts, and processing operations were dominant in the Kabansky, Pribaykalsky, Tarbagataysky districts. There have been major structural changes over the last decade. Thus, for instance, in Ivolginsky District the share of processing operations has grown 359 times, while there has been a cut-down in extraction of mineral resources, including apatite. The area's processing operations, virtually non-existent in 2005, accounted

for as much as 37% of its industrial output in 2015. The region now operates enterprises focused on food production, manufacture of construction materials, and woodworking.

To explore territorial imbalance in the development of industry, the authors conducted a cluster analysis of municipal units within the Republic of Buryatia based on the following indicators: volume of goods shipped and works and services carried out, average annual number of individuals employed, and number of organizations operating in the industrial sector of the economy. Since the indicators of industrial production for the city of Ulan-Ude are much higher than those for other municipals units, which constitutes an anomaly in distribution, the city district is left out of the cluster analysis. As a metric of distance the authors use city block (Manhattan) distance, and Ward's method is used to join the objects under study into clusters. Based on the findings of their analysis, the authors identified 4 specific clusters.

The regions within Cluster 1 have demonstrated high indicators of industrial production (Table 1).

Table 1. *Indicators for Municipal Units within Cluster 1*

Cluster 1	Worth of goods shipped (+ worth of works and services carried out), million rubles	Average annual number of individuals employed, people	Number of organizations	Municipal units
Maximum value	9867,4	3086	72	Selenginsky, Okinsky, Muysky, Kabansky
Minimum value	3187,6	1916	6	
Average value	5753,6	2301	40	
Sum	23014,4	9203	159	

The considerable reserves of mineral resources have helped propel the Okinsky and Muysky districts into a leadership position in volume of industrial production, extraction of mineral resources accounting for 99.97% and 93.6% in the regions' overall volume of industrial production respectively. The regions have demonstrated high indicators of goods shipped thanks to extraction of precious metals (gold) and semi-precious stones. Okinsky District mainly extracts gold, with graphite and nephrite being mined for as well. The mineral resource complex is a structure-directing element in the municipal economy. The prospects for the development of industry in Okinsky District are, above all, linked to boosts in extraction of mineral resources, the region possessing proved reserves of gold, nephrite, bauxite, asbestos, phosphorite, graphite, quartzite, etc. Muysky District extracts nephrite, dolomite

marble, clay, building stone, and limestone. Apart from extraction of mineral resources, Muysky District is engaged in commercial wood harvesting and production of food items (bakes goods).

The other two municipal units have notably well-developed processing and heat-and-power industries. Selenginsky District is mainly focused on production of electric power, gas, and water (86.2%). The region runs 41 enterprises, the largest of them being the condensation power plant, which provides power across Buryatia and some of the neighboring regions. The area also extracts brown coal, with less focus on processing. There is manufacture of construction materials, wood processing, food production, and metallurgy. Kabansky District runs several enterprises focused on manufacture of construction materials and some engaged in manufacture of pulp and cardboard products. These products are sold not only across Russia but to other countries as well.

Cluster 2 is comprised of 4 municipal units: the Bichursky, Zakamensky, Zaigraevsky, and Bauntovsky districts.

Table 2. *Indicators for Municipal Units within Cluster 2*

Cluster 2	Worth of goods shipped (+ worth of works and services carried out), million rubles	Average annual number of individuals employed, people	Number of organizations	Municipal units
Maximum value	2021,4	865	66	Bichursky, Zakamensky, Zaigraevsky, Bauntovsky
Minimum value	1437,2	68	19	
Average value	1789,225	562	40	
Sum	7156,9	2250	158	

The regions in this cluster are mainly focused on extraction of mineral resources. 80% of industrial production in Bichursky District is accounted for by extraction of fossil fuels, with molybdenum, gold, trim stone, tufa (used in construction), fluorspar, and clay also being extracted. The region's processing industry is represented by commercial wood harvesting and manufacture of wooden items, as well as the food industry (milk and sour-milk products, cheese, butter, bread and baked goods, pastry, flour, buckwheat, and semi-finished meat products).

Zakamensky District has considerable potential in terms of mineral resources and raw materials, including gold, coal, tungsten, molybdenum, marble, nephrite, and construction materials. The region runs large enterprises in its food industry. Zaigraevsky District extracts mineral resources, including limestone, perlite, and

dolomite. In addition, the region runs enterprises focused on food products (dairy products, margarine, butter, and baked goods), non-metallic mineral products, special-purpose machinery and equipment, ready-made metal products, woodworking, and manufacture of wooden items.

Bauntovsky District has a well-developed gold-mining sector. The region's natural-resource potential is considerable: numerous deposits of hard-rock gold, beryllium, molybdenum, uranium, nephrite, brown coal, ore, iron, manganese, limestone, etc. The area also has unique proved reserves of asbestos of high industrial value. However, in terms of the degree of mining development and use of territory Bauntovsky District is considered poorly developed for now. Nevertheless, thanks to its rich resource potential, Bauntovsky District is regarded today as one of the most significant ore-mining areas in all of Siberia.

Cluster 3 incorporates the Mukhorshibirsky, Tarbagataysky, Pribaykalsky, Kyakhtinsky, and Yeravninsky districts and the city of Severobaykalsk (Table 3).

Table 3. *Indicators for Municipal Units within Cluster 3*

Cluster 3	Worth of goods shipped (+ worth of works and services carried out), million rubles	Average annual number of individuals employed, people	Number of organizations	Municipal units
Maximum value	872,7	1181	43	Mukhorshibirsky, Tarbagataysky, Pribaykalsky, city of Severobaykalsk, Kyakhtinsky, Yeravninsky
Minimum value	216,7	299	12	
Average value	471,8	631	25	
Sum	2831	3787	147	

Mukhorshibirsky District has a well-developed food industry producing dairy products, butter, cheese, meat, sausage items, semi-finished meat products, bread, and baked goods. In Tarbagataysky District, industrial production is represented by the food industry (baked goods and pastry) and timber processing (industrial wood and lumber harvesting). The region is rich in reserves of molybdenum and has some gold.

Pribaykalsky District is the cluster's most industrially developed region. The bulk of the district's industrial production (nearly 77%) is accounted for by wood harvesting and processing. Products turned out by the region's forest enterprise meet European standards and are exported to other countries. The region also extracts mineral resources, manufactures construction materials, and turns out food products.

Most of industrial production in the Severobaykalsk and Kyakhtinsky districts is represented by the heat-and-power sector, with less focus on processing. Among the rest of the sectors operating in these regions are the food industry, wood processing, construction, and manufacture of construction materials.

Yeravninsky District is engaged in extraction of mineral resources, with a focus on placer gold. There are enterprises engaged in production and distribution of electric power and water, wood processing, and production of food.

Cluster 4 incorporates the Ivolginsky, Severo-Baykalsky, Dzhidinsky, Kurumkansky, Khorinsky, Kizhinginsky, Tunkinsky, and Barguzinsky districts, which are characterized by a poorly developed industrial complex. These areas are focused mainly on agriculture (primarily animal husbandry).

Table 4. Indicators for Municipal Units within Cluster 4

Cluster 4	Worth of goods shipped (+ worth of works and services carried out), million rubles	Average annual number of individuals employed, people	Number of organizations	Municipal units
Maximum value	268,4	217	55	Ivolginsky, Severo-Baykalsky, Dzhidinsky, Kurumkansky, Khorinsky, Kizhinginsky, Tunkinsky, Barguzinsky
Minimum value	32,9	67	12	
Average value	107,375	115	25	
Sum	859	920	200	

In Ivolginsky District, the bulk of industrial production is accounted for by production and distribution of electric power, gas, and water. The district's processing industry is represented by well-developed production of food products, woodworking and manufacture of wood items, and manufacture of construction materials. The district has large deposits of apatite, although the latest project on extracting apatite and constructing an ore mining and processing plant was eventually discontinued for ecological reasons. In addition, the district is rich in reserves of silver, fluorite, clay, sand, limestone, granite, and strontianite.

In Severo-Baykalsky District, the primary sector of industrial production is gold mining. The region also turns out fish products, sausage, semi-finished meat products, baked goods, and non-alcoholic beverages. Timber logging and processing in the region is mainly performed by private entrepreneurs.

Dzhidinsky District is the largest agrarian region in the Republic of Buryatia area-wise. The district specializes in grain growing and meat-and-dairy cattle farming. Agricultural output accounts for nearly 70% of the region's gross product. For this reason, the district has a well-developed food industry: Borgoy mutton, a variety of semi-finished meat products, dairy products, and much more. The region has deposits of mineral resources, including those used in construction: granite, syenite, basaltic andesite, rubble stone, pebble stone, sand, and gravel.

Kurumkansky District has well-developed agriculture too. The region operates enterprises specializing in processing agricultural output, producing flour, macaroni, and grit. There are also enterprises engaged in logging and timber processing and some specializing in pharmaceuticals. The land in Kurumkansky District is rich in reserves of non-ferrous metals and gold.

The industry of the Khorinsky and Kizhinginsky districts is represented by the heat-and-power sector and several processing sectors, including woodworking and food production, which is due to the regions' agricultural specialization, as is the case with virtually all other regions within this cluster. There are small enterprises engaged in processing meat, dairy, and vegetable products. Kizhinginsky District is famous for its cheeses and sausages. The area also has deposits of beryllium ores and fluorite.

The Barguzinsky and Tunkinsky districts have a well-developed tourism infrastructure, which is due to their proximity to Lake Baikal and their unique medicinal mineral water springs. A major restraining factor in the development of industrial production in the area is a set of environmental restrictions associated with a regime governing the conduct of business activity across the watershed of Lake Baikal, designed to help conserve the lake's unique natural ecosystem.

Industry in these districts is represented by logging and wood-processing enterprises, enterprises specializing in distribution of electric power and production of food products, like baked goods, semi-finished meat products, dairy products, as well as beverages and bottled water. To note, these regions' potential for industrial growth is, above all, associated with their natural resources, unique in volume and diversity. Their rich forest and water resources, fauna, which is comprised of not only taiga animals but includes rare ones with precious furs (e.g., the Barguzinsky sable) and commercially important ones, reserves of mineral resources, their forests rich in berry shrubs, nuts, mushrooms, and medicinal plants – all these resources may help ensure growth in industrial production (Bazarova, 2015).

The authors' assessment of the production specialization of each cluster revealed that the Republic of Buryatia is currently characterized by pronounced sectoral and territorial disproportions, which are due to a mismatch between the republic's natural resources and rich raw-materials base and the degree to which they have

been developed. The center of the region's industry is the capital Ulan-Ude, where the bulk of production, capital, investment, innovation, and labor resources is concentrated. The principal sectors within the city's industrial complex are mechanical engineering (machine building), metal working, the power industry, food production, textile and garment manufacture, extraction of mineral resources, and the chemical industry.

To help expand and impel the growth of the region's industry, it is worth identifying the prospects for municipal units factoring in existing natural, human, and financial resources, as well as restrictions associated with a special regime governing the conduct of business activity, as prescribed by the Federal Law on the Conservation of Lake Baikal. The buffer zone around the water area of Lake Baikal accounts for 75% of the territory of the Republic of Buryatia and comprises the city of Ulan-Ude, the Zakamensky, Dzhidinsky, Kyakhtinsky, Selenginsky, Bichursky, Mukhorshibirsky, Ivolginsky, Kizhinginsky, Khorinsky, Tarbagataysky, Zaigraevsky, and Kurumkansky districts, as well as a portion of the Barguzinsky, Pribaykalsky, Yeravninsky, Severo-Baykalsky, and Muysky districts. Enterprises operating in the area are having major difficulties in terms of setting up additional treatment facilities to avoid exceeding the limits on air pollutant emissions and wastewater discharge. All this is complicating the development of the region's industrial complex significantly.

The atmospheric influence zone incorporates the areas within Irkutsk Oblast and a minor portion of Severo-Baykalsky District located in the Republic of Buryatia. The rest of the republic's territory lies outside the boundaries of the Lake Baikal watershed and does not form part of any of the ecological zones. Consequently, these territories may offer good prospects for the industrial development of just about any sector of the economy. It may be worth looking at the prospects for the development of industrial production by reference to the specificity of each ecological zone, since restrictions that are currently in effect within them have, above all, to do with production activity (Khaykhadaeva, 2015).

The authors' statistical study involved putting together an equation for the trend based on 5 indexes of unevenness. Due to lack of a trend for the mean of the time series, it became necessary to employ models with a variable structure. Using the equations obtained, the authors assessed the values of the indexes of unevenness for a future period. Note that on 3 indicators – volume of shipped goods of own production, retail turnover, and volume of services provided to the population – the index of unevenness is expected to grow in the future, while declines in unevenness are expected on the 'municipal unit's own budget revenue' and 'volume of production of agricultural output' indicators.

Discussion

The authors' statistical analysis of unevenness in the social-economic development of municipal units revealed non-uniformity on certain economic and social indicators. Thus, for instance, high levels of unevenness levels were observed on the following indicators: (1) volume of shipped foods of own production and works and services carried out by own efforts across the pure types of economic activity; (2) number of people employed in the economy; (3) investment in fixed capital; capital stock as of the end of the year based on gross book value across commercial organizations. Fairly low levels of unevenness were registered on the following indicators: (1) average monthly nominal wages paid; (2) volume of production of agricultural output; (3) municipal unit's own budget revenue. Considerable unevenness in the development of municipal units was observed in the social sphere, mainly in the volume of paid services provided to the population, teacher supply, and natural increase.

Investigating non-uniform development on the 'volume of shipped foods of own production and works and services carried out by own efforts across the pure types of economic activity' indicator using the distribution unevenness coefficient and structural change coefficients revealed a link between the cyclicity of the economy and the unevenness of development. Assessing unevenness among municipal units on level of social and economic development indicated no "match" between economic and social distribution.

To help optimize the spatial structure of the Republic of Buryatia, the authors grouped municipal units by type of production specialization, which helped reveal each cluster's potential for industrial production, in keeping with established environmental regulations, and develop strategic areas for the development of production specialization sectors and growth in the regional economy as a whole. Regional policy on economic development ought to be oriented toward the effective use of spatial potential (Aganbegyan, Mikheeva, & Fetisov, 2012). There is a need to develop new methods and principles of management for optimizing the spatial structure of the region's economy. A rational spatial structure will help: economic entities to assess their ways and outcomes of conducting business, as well as assess the prospects for investing funds with a view to enhancing existing projects and launching new ones; state and regional authorities to assess the potential and prospects for the development of the region's economic space and work out new approaches to managing, planning, and forecasting the region's social-economic development.

Conclusions

Unevenness may be regarded as a positive factor, as it is determined by regional specialization and may lead to boosts in social labor productivity. However, this

process is only positive as long as there are no disproportions arising that may lead to the regional disintegration of the single economic space. There *is* a need to even out the levels of economic development in regions, but this may weaken the incentives for economic entities. The choice of indicators for assessing unevenness is governed by relevant managerial decisions aimed at determining the degree to which local authorities need additional funding or associated with assessing the efficiency of managing the social-economic development of municipal units, or aimed at determining the existing degree of unevenness of social-economic development among municipal units, and many others (Belov, 2012).

The authors' analysis of factors influencing the unevenness index revealed that the development of non-uniformity in various sectors of the economy is caused by various reasons. Models obtained from research into the subject mostly employ the following indicators: freight turnover, investment in fixed capital, the export trade of the Republic Buryatia (Tsyrenov, Ruban, Khaykhadaeva, Vanchikova, & Munkueva, 2016). Notice that changing these indicators may increase the extent of unevenness.

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